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Re: RD-79, T.O. 7

Dear

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Task Order 7 of Contract No. RD-79 calls for performance of system tests. Upon commencement of these tests, it was found that the GFE recorders are incompatible with the system in that they introduce a bias voltage of such proportions on the recorder input circuits as to prohibit operation of the activity amplifier in its proper mode. In addition, the amplitude of the bias voltage across the record heads in the recorders tested was reduced to a value just slightly under the recommended level given by the manufacturer when the recorder was "loaded" by the other equipment in the system.

The cognizant engineers of the client requested that an investigation be made and authorized that time be spent to determine a system design change to prevent this bias voltage from being fed to and adversely affecting the activity amplifier and other associated equipment in the system.

In accordance with this authorization, a number of possible solutions were studied and evaluated, and the results are as follows:

1. Notch filters - Impractical because of possible wide (3 kc) variation in bias frequency.
2. Low pass filter - Could be used, but would have to be mounted outside the recorder because of size. Cost and delivery dates, (2 each at \$22.50, and 5 to 8 weeks), make this method seem less desirable.

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3. Emitter follower - Will prevent bias voltage from interfering with other units but does not solve the problem of "loading" of bias circuits.
4. Grounded base amplifier - Prevents bias from interfering with other units and isolates bias circuits thereby preventing "loading". May possibly be small enough to be incorporated within the recorder.

In addition to selecting the proper method of eliminating the trouble, a decision had to be reached as to the location of the unit within the system. Again a number of solutions were considered as follows:

1. Plug in adapter - Simple and would require no change in recorder but was mechanically unsound because of lack of support for adapter.
2. System cable modification - Discarded because of impossibility of returning all system cables for modification.
3. "Black box with cable" - Would require no change in recorder but would be very expensive because of number of components and cable terminations required.
4. Recorder modification kit - Simplest and least expensive of all but would require modification of recorders to be used with the system.

After considering the above possibilities, the clients engineers on November 18 gave authority to construct two pilot models of the grounded base amplifiers and to incorporate these in the two GFE recorders supplied for system tests. Measurements will then be made to determine the efficiency of the modifications.

[redacted] will submit cost estimates for the additional money and time required for the performance of the tests and the design of the modifications necessary to correct the undesirable bias output in the recorders, as soon as sufficient information is available upon which to base these estimates. We believe this can be done early in December.

Also, as requested by clients engineers, cost estimates will be submitted for (1) - 100 modification kits to be incorporated as a field change in the present recorders, and (2) - 100 modification kits in a form to be used externally with the recorders.

Very truly yours,

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